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CLINICAL COMMUNICATION TO THE EDITOR

Q Fever in US Military Returning from Iraq

To the Editor:

Q fever is a zoonotic infection caused by *Coxiella burnetii* that may present with acute or chronic clinical manifestations, including a nonspecific febrile illness, pneumonia, hepatitis, or endocarditis.¹ Although unusual in the US, Q fever is endemic in the Middle East. Our case series raises the concern that Q fever may be a significant infectious disease threat to US military serving in Iraq.² In November 2004, 2 military service members from the same Marine battalion became ill upon return from a 7-month tour of duty in Iraq. The first patient was a 35-year-old medical corpsman who experienced fever to 39.4°C, chills, rigors, severe retro-orbital headache, loose stools, and lower back and calf pain. Cerebrospinal fluid analysis was normal. A chest radiograph and an abdominal computed tomography scan with intravenous and oral contrast also were normal. Although the patient defervesced without antibiotics, his serology for Q fever subsequently returned positive, and he was treated with 21 days of doxycycline. The second patient, a 23-year-old US Marine infantryman, experienced fever to 41.1°C, chills, rigors, sore throat, headache, and diffuse myalgias. His chest radiograph demonstrated diffuse bilateral interstitial markings. He defervesced within 24 hours after starting empiric doxycycline, and his Q fever serology later returned positive. Both soldiers noted goats wandering through the camp but denied other exposures. More recently, in September 2006, a third patient, a 24-year-old US Marine officer, developed fevers to 39.3°C, chills, headache, and photophobia 3 weeks after returning from Iraq. He denied specific exposures. His chest radiograph was normal, as was analysis of his cerebrospinal fluid. He defervesced within 24 hours of initiating empiric doxycycline. His serology was negative for Q fever on admission but was positive when repeated 1 week later. All 3 patients had similar laboratory abnormalities including

hyponatremia, hepatitis, leucopenia, and thrombocytopenia (Table). In each case, the serology for acute Q fever was positive by an immunofluorescence assay (Focus Technologies Q Fever IFA IgM and IgG assays). Interestingly, the first 2 patients had an isolated positive hepatitis B core antibody with other hepatitis B studies negative. Repeat hepatitis B core antibody testing was negative on discharge. In addition to negative cultures of blood, urine, stool, and cerebrospinal fluid, other negative studies included stool and throat swabs for *Enterovirus* by PCR, malaria smears, serologies for dengue, sand fly fever viruses, Rift Valley Fever, West Nile virus, *Leptospira*, *Legionella*, *Bartonella*, *Borrelia*, *Brucella*, *Ehrlichia*, and several *Rickettsia* species.

Although it is endemic in Iraq, only 3 cases of Q fever were reported during the Gulf War (1990-1991).³ In 2003, an evaluation of 62 cases of pneumonia in Iraq-deployed US troops revealed 8 Q fever seroconversions,⁴ and Leung-

Table Selected Laboratory Values and Serological Test Results for Q Fever*

Laboratory (normal range)	Patient 1	Patient 2	Patient 3
Serum sodium (137-145 mEq/L)	130	130	134
Aspartate transaminase (17-49 Units/L)	128	351	305
Alanine transaminase (7-56 Units/L)	155	258	425
Alkaline phosphatase (36-126 Units/L)	455	356	186
Total bilirubin (0.2-1.3 mg/dL)	1.8	4.9	0.7
WBC (4.0-11.0 thousand cells/ μ L)	3.6	3.8	2.0
Platelets (150-450 thousand cells/ μ L)	120	45	89
<i>Coxiella burnetii</i> Phase I IgM ($\leq 1:64$)	$\geq 1:1024$	$\geq 1:1024$	$\geq 1:1024$
<i>Coxiella burnetii</i> Phase I IgG ($\leq 1:16$)	1:512	1:32	1:16
<i>Coxiella burnetii</i> Phase II IgM ($\leq 1:64$)	$\geq 1:1024$	$\geq 1:1024$	1:512
<i>Coxiella burnetii</i> Phase II IgG ($\leq 1:16$)	$\geq 1:1024$	$\geq 1:1024$	1:128

WBC = white blood cell.

*Serology by Focus Diagnostics Q Fever Immunofluorescence Assay.

The opinions and assertions contained herein are those of the authors and are not to be construed as official or as reflecting the views of the Department of Defense, the Department of the Navy, or the naval services at large.

Requests for reprints should be addressed to Todd D. Gleeson, MD, Division of Infectious Diseases, Department of Internal Medicine, National Naval Medical Center, 8901 Wisconsin Avenue, Bethesda, MD 20889.

E-mail address: tdgleeson@bethesda.med.navy.mil

Shea et al. recently reported 2 cases of acute Q fever in military service members.² We postulate that our soldiers acquired *C. burnetii* infection via aerosolization of infectious particles most likely associated with the goats in the environment. In addition, although rheumatoid factor, antiphospholipid antibodies, and smooth muscle antibodies are common in patients with Q fever,¹ a false-positive hepatitis B core antibody has not previously been described. Our case series raises the concern that Q fever may be occurring in our military at a higher rate than previously predicted. As Q fever has a long incubation period (average 14-21 days) and may present as acute or chronic disease, nonmilitary physicians should be aware of this potential diagnosis in individuals with this geographic exposure.

Todd D. Gleeson, MD
Catherine F. Decker, MD
*Division of Infectious Diseases
National Naval Medical Center
Bethesda, Md*

Mark D. Johnson, MD
*Department of Internal Medicine
National Naval Medical Center
Bethesda, Md*

Joshua D. Hartzell, MD
*Division of Infectious Diseases
Department of Internal Medicine
Walter Reed Army Medical Center
Washington, DC*

John R. Mascola, MD
*Vaccine Research Center
National Institute of Allergy and Infectious Diseases
National Institutes of Health
Bethesda, Md*

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